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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,072

12/09/2005

Kiyohito Ishida

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EXAMINER

ZHU, WEIPING

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/560,072	<b>Applicant(s)</b> ISHIDA ET AL.	
	<b>Examiner</b> WEIPING ZHU	<b>Art Unit</b> 1793	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4 and 8-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/5/2009</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 5, 2009 has been entered.

### ***Status of Claims***

2. Claims 1, 4 and 8-13 are currently under examination wherein claim 1 has been amended in applicant's amendment filed on March 5, 2009.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2003-155552 A.

With respect to claim 1, JP ('552 A) disclose a continuous carburizing process under a pressure of 50 – 100 Pa in a carburizing atmosphere using acetylene (i.e. an

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unsaturated hydrocarbon) as a carburizing medium comprising (abstract, paragraphs [0035] and [0036] and claim 3, machine translation): keeping the pressure in a surrounding area of heating chambers lower than the pressure of the carburizing atmosphere in the chambers; activating carbon in the carburizing atmosphere by heating the carburizing atmosphere to 900° C; forming a nitrogen gas atmosphere (i.e. the carrier gas atmosphere as claimed) spatially continued from the carburizing atmosphere and heated to the same temperature; preventing the carburizing medium in the carburizing atmosphere from entering the nitrogen gas atmosphere and the nitrogen gas in the nitrogen gas atmosphere from entering the carburizing atmosphere while keeping the two atmospheres open and spatially connecting with each other; passing metal rods, which read on the claimed continuous material, continuously through the carburizing atmosphere and thereby carburizing the rods; diffusing the carbon into the inner section of the rods; and repeating the carburizing and the diffusing steps multiple times.

The carburizing pressure and the carburizing temperature of JP ('552 A) are within the claimed ranges. Therefore, a prima facie case of obviousness exists between the prior art and the claimed invention. See MPEP 2144.05 I.

With respect to claims 8 and 10, JP ('552 A) discloses that the carburizing is performed until the surface of the rod reaches or exceeds the desired carbon content (paragraph [0037], machine translation).

With respect to claim 9, JP ('552 A) does not disclose the diameter of the wire as claimed. However it is well settled that merely changing the size of an article is not a

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matter of invention. See MPEP 2144.04 IV. The process disclosed in the prior art appears well capable of treating materials of the dimensions presently claimed.

With respect to claims 11-13, JP ('552 A) discloses the continuous vacuum carburizing process can be used to carburize metallic materials (paragraph [0004]) without limit the types of the metallic materials. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to carburize the metallic materials as claimed with the continuous vacuum carburizing process of JP ('552 A) with a reasonable expectation of success, because JP ('552 A) disclosed the same utility for all types of metallic materials suitable for a carburizing treatment. See MPEP 2144.05 I.

4. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('552 A) as applied to claim 1 above in view of Poor et al. (US Pub. 2003/0089426 A1).

With respect to claim 4, JP ('552 A) does not disclose bring the carbon into plasma state as claimed. Poor et al. ('426 A1) discloses generating plasma of carbon in a vacuum carburizing furnace chamber (claim 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to generating plasma of carbon in the continuous vacuum carburizing chamber of JP ('552 A) in order to produce a uniform infusion of carbon over the irregular part surface as disclosed by Poor et al. ('426 A1) (paragraph [0010]).

***Response to Arguments***

5. The applicant's arguments filed on March 5, 2009 have been fully considered but they are not persuasive.

The applicant argues that there is no disclosure of preventing the carburizing gas from entering a carrier gas atmosphere in an adjacent heating chamber and a carrier gas from entering the carburizing atmosphere as claimed in the instant claim 1; JP ('552 A) does not form a carrier gas atmosphere spatially continued from the carburizing gas atmosphere; JP ('552 A) acknowledges that carburizing gas can flow into adjacent heating chambers when the doors are opened, therefore JP ('552 A) teaches against keeping the doors opened at all times when two different treatments (different atmospheres) occur at adjacent heating chambers; and the disclosure of doors in JP ('552 A) between the inactive gas and the carburizing gas atmospheres teaches away from "continuously passing one of a continuous material ... through the carburizing atmosphere and the carrier gas atmosphere" of the instant claim 1.

In response, the examiner notes that JP ('552 A) does teach preventing the carburizing gas from entering a carrier gas atmosphere in an adjacent heating chamber and a carrier gas from entering the carburizing atmosphere as claimed in the instant claim 1 by exhausting the carburizing gas leaked into the vacuum cell 2 by the main vacuum valve 10 provided in the vacuum cell 2 and by keeping the pressures in the adjacent heating chambers higher than the pressure in the vacuum cell 2, therefore the carburizing gas does not flow into the adjacent heating chambers (paragraph [0028], machine translation); JP ('552 A) does teach forming an inactive gas atmosphere

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spatially continued from the carburizing gas atmosphere (paragraphs [0028]-[0030], machine translation); the doors between the heating chambers are provided to hold the temperature of the interior of each chambers as disclosed by JP ('552 A) (paragraph [0025], machine translation), which would obviously be kept closed most of the time during the process to save the energy, but would not prevent continuously passing the rod through the carburizing atmosphere and the carrier gas atmosphere at all; and it is well held that mere disclosure of alternative designs does not teach away. See *In re Fulton*, 391 F. 3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

### ***Conclusions***

6. This Office action is non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Wyszomierski/  
Primary Examiner  
Art Unit 1793

WZ  
4/15/2009